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CASE REPORT

An endovascular treatment of a thoracic aortic injury caused by a misplaced pedicle screw: Case report and review of the literature



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Aortic injuries are devastating complications after spinal surgery. We here would like to share our experience with a successful endovascular treatment of an iatrogenic thoracic aortic injury caused by misplaced pedicle screw after spinal surgery. A patient underwent posterior spinal surgery for L1 burst fracture was transferred to our department for instrumentation removal. An iatrogenic thoracic aortic injury at T11 level caused by a pedicle screw was recognized after routine CT scans. Complete screw extraction and instrumentation removal were performed after the placement of a thoracic aortic stent graft covering the injured region. The patient had an uneventful postoperative period and no complications were observed in the 1 and 12-month follow-up by contrast-enhanced CT scans. For the delayed thoracic aortic injuries which usually were usually shown on CT scans as pseudoaneurysm or penetration of the aorta, stent graft implantation would provide a preferred solution with high-effectiveness, low-invasiveness and fewer complications compared with conventional open surgery.

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Introduction

Iatrogenic vascular injuries after spinal surgery, although infrequent, are associated with life-threatening complications and a devastating mortality rate.¹ The most frequently occurring vascular lesions including arterial lacerations

accompanied with acute hemorrhage, pseudoaneurysm, thrombosis, and arteriovenous fistula.

Delayed aortic injuries are usually caused by pseudoaneurysm formation, or partial aorta wall penetration.²⁻⁹ The clinical symptoms of a delayed aortic injury are typically insidious or inexistent, making early diagnosis difficult.^{8,10} Conventionally, endovascular stent graft implantation for spinal intervention related thoracic aortic lesions are used as a preventive method for patients, rather than an established therapeutic option.⁶ In the present clinical case report, we present a successful endovascular procedure with stent graft to treat an uncommon thoracic aortic injury caused by a misplaced pedicle screw. Also, we conducted a thorough literature review of similar cases. We wish to share our experience of endovascular stent graft implantation for iatrogenic aortic injuries after spinal surgery with our colleagues.

Case report

A 24-year-old woman with a history of L1 burst fracture after a traffic accident underwent posterior spinal stabilization with the placement of spinal instrumentation (two longitudinal rods and six posteriorly placed pedicle screws

in T11, T12, and L2, two in each) at another hospital 17 months earlier. The procedure was well tolerated and the patient had an uneventful postoperative period. A computed tomography (CT) scan (Somatom Plus4 VolumeZoom; Siemens, Forchheim, Germany) revealed a malpositioned pedicle screw, which possibly caused partial penetration through the posterior wall of the thoracic aorta. The patient was therefore transferred to our department for evaluation of instrumentation removal and further treatment.

After transfer, routine examinations and laboratory tests indicated that the general condition of the patient appeared to be good and no symptom of hemodynamic instability was observed. Non-contrast-enhanced CT and contrast-enhanced CT scans demonstrated that the left sided pedicle screw at T11 level was half outside the 11th thoracic vertebra and had perforated the anterior cortex of the vertebra, causing an impingement on the posterior thoracic aortic wall by the tip (Figs. 1 and 2). Although there was no evidence of hematoma, pseudoaneurysm formation, or pleural effusion observed, it was clear that the malpositioned pedicle screw had caused an aortic lesion. However, it is difficult for us to discern by the radiologic evidence if the tip had perforated the posterior thoracic wall and penetrated into the lumen, or just

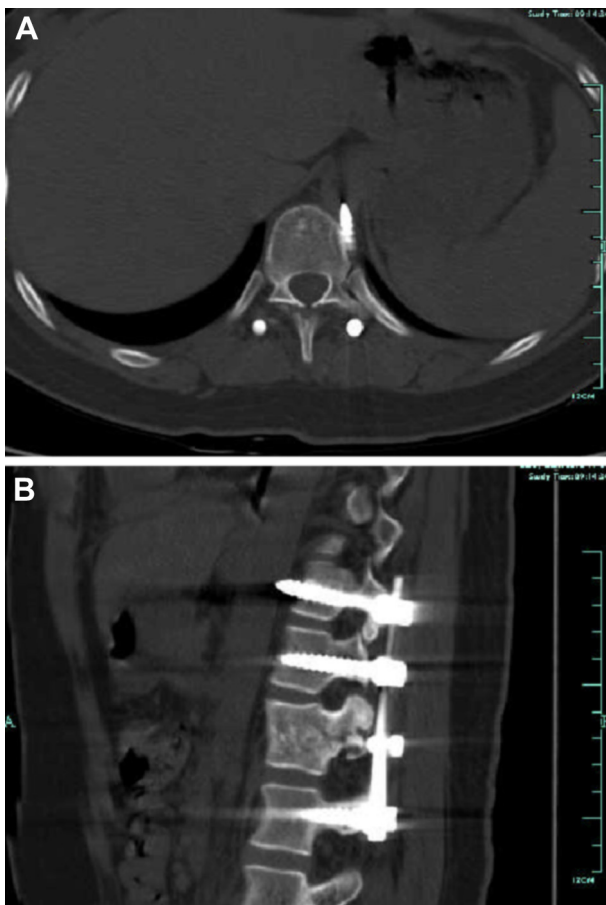


Figure 1 Noncontrast computed tomography scan demonstrates that the left T11 pedicle screw has caused an impingement on the posterior thoracic aortic wall.

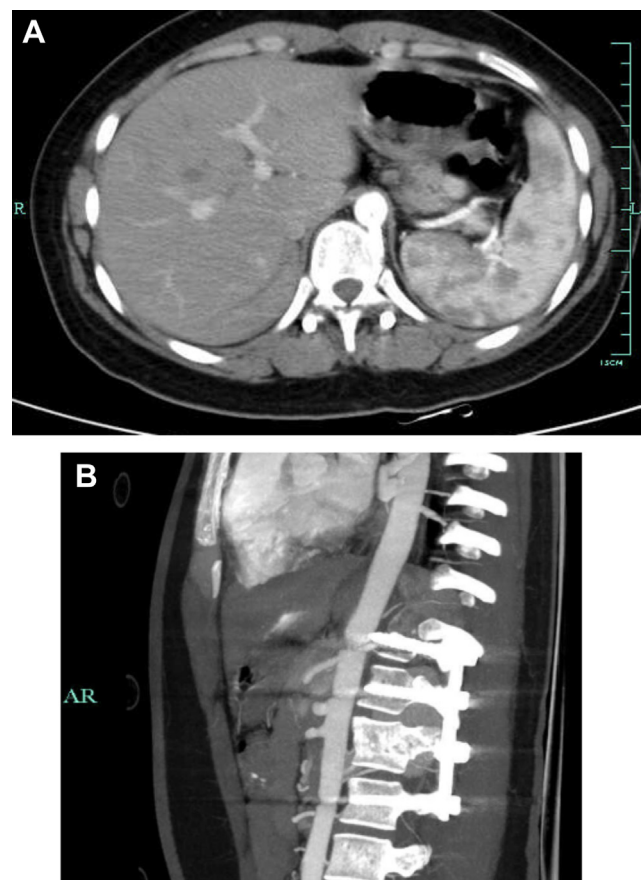


Figure 2 No evidence of hematoma, pseudoaneurysm formation or pleural effusion is observed in the contrast-enhanced computed tomography scan.

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